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DIVERTICULA OF THE BLADDER

REPORT OF AN UNUSUAL CASE

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A male aged 61 years was first seen in July 1949. For the past three years the patient had been a cardiac invalid and had spent a great part of this time in bed. Three months before, while in bed, he developed acute retention and a suprapubic operation was performed. When he was first seen he had the same suprapubic tube in that had been inserted three month before, and the degree of phosphatic encrustation was unbelievable. The lumen of the tube had practically disappeared. Blood pressure 250/150 mm. Hg and the heart was grossly enlarged. The pulse was irregular and auricular fibrillation was present. There was slight pitting oedema of the extremities and the liver was slightly enlarged. The bladder was markedly infected and on rectal examination he had an enlarged infected prostate, but it was not adenomatus.

The suprapubic tube was removed and he was put on silver nitrate bladder wash-outs until the returning fluid was clear. Cystoscopy showed a small contracted bladder of markedly diminished capacity with two diverticulum openings on the right. On rectal examination the diverticulum was clearly palpable and massage of this produced foul pus.

A cystogram showed a large diverticulum on the right side (Fig. 1) and the X-ray report suggested that there may have been a filling defect in it. This so-called filling defect was later shown to be grumous material.

A week later cystoscopy showed the bladder to be much clearer and the impression gained was that these diverticular orifices communicated with the same sac. There was no prostatic adenoma but there was a median bar. A No. 8 ureteric catheter was inserted into the diverticulum and about 4 oz. of stinking pus evacuated. This catheter was left *in situ* and the diverticulum itself was washed out daily for four days. This resulted in marked improvement in the state of the bladder. It was quite remarkable that, with the diverticulum empty, due to the ureteric catheter draining it, the patient could pass urine without difficulty. Immediately the catheter was removed the diverticulum filled, could be easily palpated rectally, and the patient developed retention.

Progress was hampered by a severe attack of cardiac asthma and the opinion of two physicians was that he would not stand an anaesthetic, let alone an operation.

In spite of this it was decided to operate. Caudal anaesthesia was induced by means of 0.8 c.c. of 1:200 nupercaine. With McCarthy's resectoscope, the mouth of the diverticulum was resected in an attempt to make the bladder cavity and the diverticulum continuous. A fair amount of tissue was resected and the opening into the diverticulum was greatly enlarged. At the same session resection of the median bar was carried out.

The post-operative period was rather stormy as the patient developed a clot bladder which was very difficult to rectify. Using a Toomey's syringe the clot was evacuated from the bladder after which the haemorrhage was controlled.

With a little encouragement the suprapubic wound healed and when the Foley's catheter was removed the patient could pass urine freely. This free passage of urine has continued now for a period of five months, and the patient's general health has vastly improved.

The result is claimed as excellent. On one occasion after discharge the patient developed rather marked urinary infection, but this cleared up remarkably on a single day's course (16 capsules) of aureomycin.

DISCUSSION

A diverticulum, a pouch lined by vesical mucous membrane, communicating with the bladder by a narrow opening, is essentially a hernia of the walls of the

bladder outwards, aggravated by increased intra-vesical pressure. It differs radically from the pouches or saccules of a trabeculated bladder seen typically in chronic prostatic obstruction in which there is a widespread or universal trabeculation.

Pathological Anatomy. Diverticula may be single or multiple, small as a pea or as large as the bladder cavity or even larger. The opening into the diverticulum is always much smaller than the actual sac and when viewed from the interior of the bladder, it has the appearance of an orifice. The orifice varies from a minute opening to one large enough to admit a finger. The size of the orifice has no relation whatever to the size of the pouch, which indicates that any diagnosis of diverticulum made cystoscopically should be folowed by a cystogram to estimate the size and determine the position of the pouch. At cystoscopy the mouth of a diverticulum is seen as a clearly punched out, oval or circular opening in a healthy bladder wall. This aperture often resembles a sphincter, its size varying from 1-2 cm. in diameter and having a tendency to retract as the bladder is emptied. (This accounts for many being missed at cystoscopy.) In no sense is it a sphincter, for it has no circular layer of muscle around the opening. This sphincter-like action is produced by the changing size of the bladder and the interacting muscle fibres through which the diverticulum has developed. An associated generalized trabeculation or merely a localized trabeculation around the opening may show up, but usually the opening is surrounded by radiating ridges or puckering of the mucous membrane, especially when the bladder is not fully distended. When situated near the ureteric orifice, the interureteric bar on the same side may be hypertrophied. The ureteric orifice may open in the wall of the diverticulum, and thus not be seen cystoscopically; or it may open on the margin of it, but in the great majority of cases it opens to one side of it.

Most diverticula retain their urinary content after the bladder has been emptied. This may be due to one of many causes or a combination of causes:

(*a*) Smallness of the communicating opening.

(*b*) Dependent position of the pouch.

(*c*) Inability to contract due to paucity of muscle in the wall.

(*d*) Fixicity of the sac due to a peridiverticulitis.

Structure of the Wall. The diverticulum is lined by mucous membrane continuous with that of the bladder. Virchow and Englisch maintain that if the diverticulum has a muscle layer in its wall then it is one of congenital origin. This view is not generally accepted. Young, in an extensive review, was able always to demonstrate muscle in the wall even though it was very thin. Secondary pockets may occur in the diverticulum and a peridiverticulitis usually results in its being very adherent to its surrounding structures.

Etiology. Although this has been the subject of careful study, much difference of opinion still exists. The embryological viewpoint assumes several weak spots in the wall of the bladder, amongst them the site of the urachus in the vertex and the site of penetration of the ureters. Gayet and Cibert state that certain diverticula are the result of incomplete development of ureteric or seminal buds as the majority occur in the region of the ureteric orifices. Peacock states that 75-85% of cases occur posterior to the trigone adjacent to the ureteric orifices either in the posterior or lateral walls of the bladder. These are doubtless important factors, though diverticula of urachal origin are extremely rare. In *Urological Oddities* O'Brien cites the case of a child of two years old who was admitted with acute retention. Until four days before admission the child was quite well and could always pass urine freely. Retention was of sudden onset and the residual urine was 19 oz. There was no evidence of obstruction and the whole condition was cured by diverticulectomy.

From observations of bladder wall changes in tabes dorsalis, viz. marked trabeculation and loss of contratile power, we see the importance of a complete and intact nerve supply to this organ. In those bladders in which diverticula develop one may surmise some nerve supply upset in the region of the ureteric orifices. If one cuts through the muscle of the bladder down to the mucus membrane an immediate herniation occurs—the beginning of a diverticulum. Thus it is quite feasible to claim that regional upset in nerve supply, by interfering with the muscle, could initiate a pouting of the mucous membrane which could be the precursor of a diverticulum.

Role of Lower Urinary Tract Obstruction. There is general agreement that obstruction to the outflow of urine is a major factor in the development of a diverticulum. Any form of obstruction at or below the bladder neck, whether it be in the form of valves, prostatic hypertrophy or malignancy, contractures or bars, plays a big part in the causation of diverticula. The condition is usually met with after middle age in men when one expects to meet with urinary obstruction. Lower, in a series of 150 cases of bladder diverticula, found women affected in two cases only.

Clinically by cystoscopy and cystography Young was able to follow the changes in a bladder subsequent to obstruction. First is seen the basket-like trabeculation of the interior of the bladder; then the formation of shallow cellules with their width greater than their depth. By considerably over-distending such a bladder a cellule forms, is pushed outwards and then flattens again on reducing the amount of fluid in the bladder. In the presence of constant increased intravesical pressure the development of the cellules is slow but sure and individual ones may enlarge greatly and hold up to 3,000 c.c. Those who uphold the embryological theory state that these are congenitally weak spots in the bladder wall which develop into diverticula as a result of obstruction.

In something like 90% of bladder diverticula, obstruction of some form is present and Kutzman in a study of 100 cases states 'it was nearly always possible to demonstrate some type of bladder neck or urethral obstruction'. McMartin reports a case which was referred to him with symptoms which characterize prostatic hypertrophy. Previously he had had three resections. Careful investigation showed a large diverticulum containing 12 stones. Diverticulectomy cured the condition.

Symptoms. Diverticula present no symptoms pathogomonic of the condition. It is not uncommon to find symptomless diverticula on routine examination. Thus

the symptoms are many and varied, being chiefly those of obstruction of the lower urinary tract, such as increased frequency, and embarrassed urinary stream, i.e. lack of force; nocturia; burning; haematuria; pyuria; vague pains in the pelvis.

There are a few symptoms which, if present, strongly suggest a diverticulum of the bladder, e.g.:

1. If two or three successive attempts are required to empty the bladder.
2. If during micturition the first part of the stream is relatively clear and the second part becomes progressively purulent as the bladder empties.
3. If after emptying the bladder a catheter is passed and a purulent residual urine is found.
4. Tumour of the lower abdomen which may be palpable abdominally or rectally and is more obvious when the bladder is distended.
5. A most offensive-smelling urine.

One may also get bouts of frequency with evidence of infection, increasing difficulty of micturition, or one or more haemorrhages. On the other hand, the presenting symptoms may be merely those of the causative factor.

Peacock gives the following table to indicate the incidence of the varying symptoms:

Subjective Symptoms:
Frequency, 74%.
Nocturia, 84%
Haematuria, 43% (microscopic or macroscopic).
Objective Symptoms:
Trabeculation, 85%.
Infection, 80%.
Residual Urine, 47%.
Calculus, 6%.
Neoplasm, 6%.

Diagnosis. Until 1906 only five cases of diverticula had been reported in the United States, although Durrieux had reported 194 cases in 1901 after an extensive review of the foreign literature. One reason for the paucity of reports doubtless is the fact that even if the existence of such a condition was suspected, the profession did not have at hand the means whereby to make the proper diagnosis. Recently the number of reported cases has increased in proportion to the development of diagnostic measures. The only sure method of diagnosing the condition is by means of cystoscopy and cystography. Even with the cystoscope it may be extremely difficult to pick out the opening among the hills and valleys of a trabeculated, contracted bladder. The extent of a diverticulum cannot be judged by means of cystoscope and the size and position of the sac can be judged only by cystography. The depth of the diverticulum can be judged roughly by inserting a ureteric catheter into it.

Complications. The complications which occur as a result of diverticula of the urinary bladder are:

1. Infection.
2. Pressure on ureter or urethra.
3. Calculus formation.
4. Malignancy.

Though a great number of diverticula may remain symptomless for long periods, they usually become manifest as a result of infection. The basis of the infection is stasis, for with incomplete emptying of the bladder with stagnation of urine, infection invariably results. The degree of infection varies from a cystitis, a diverticulitis, a peridiverticulitis or an ulcerative cystitis which may culminate in rupture either of the diverticulum itself or of the bladder in the region of the neck of the diverticulum.

Pressure or dragging on the ureter may lead to back pressure on the kidney giving rise to hydro-ureter or hydronephrosis. This, if complicated by infection, can lead to serious effects. Pressure on the urethra may result in acute retention of urine.

Calculus formation is not an uncommon feature of diverticula. The combination of stasis and infection plays a big part in their formation. The calculi, usually phosphates, may be located either in the diverticulum or in the bladder, or it may occur in a collar-stud form, being situated in the diverticulum and projecting into the bladder.

The incidence of new growth complicating a diverticulum is given by some authorities as high as 5%. The new growth is usually in the form of a papilloma which may occur in the diverticulum, and therefore be hidden from cystoscopic view but which may be seen as a filling defect on cystography; or it may be situated either on the margin of the opening or just adjacent to it. Owing to the proximity of diverticula to the ureteric orifices their early involvement by new growth is a common feature.

Treatment. The correction of the condition is a problem in judgment, as the only remedy is surgical removal. Cystograms often depict diverticula as simple sacculations with a narrow neck and easily accessible to surgical removal. Those that have had enough clinical experience will soon dispel this illusion, for their surgical removal is no easy matter. Any obstruction should be removed whether it be stricture of the urethra or bladder neck obstruction.

If no severe symptoms are present and the patient's general condition is poor, removal of any obstructing agent may prove sufficient. Perhaps the strongest indications for removal of the diverticulum itself are:

1. New growth of any type;
2. Stone;
3. Intractable infection where the patient is affected by toxic absorption;
4. Gross interference with the emptying power of the bladder.

In cases where removal of the sac was too extensive or too dangerous, Pousson and Chute advocated open cystotomy and enlargement of the orifice to institute drainage.

The details of diverticulectomy will not be discussed, but in brief, the diverticulum may be removed by:

1. Working extravesically without opening the bladder;
2. Working from the interior of the bladder;
3. A combination of the above where the diverticulum is packed with gauze from within the bladder, and is then dissected and removed extravesically.

Whatever method is employed, it is important (after diverticulectomy) to remove any form of obstruction.

I wish to express my thanks to Mr. R. Campbell Begg of Johannesburg, for demonstrating the technique of this unusual form of treatment and for his kind permision to publish this paper.

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VAN DIE REDAKSIE

DIE GIFSTOF VAN KAAKKLEM EN SY ANTITOKSIEN

In 'n memorandum van die Departement van Biologiese Standaarde, *National Institute for Medical Research*, Londen, wat aan die Deskundige Komitee oor Biologiese Normalisering voorgelê en in die *Bulletin of the World Health Organization*[1] gepubliseer is, word 'n beskrywing gegee van die huidige stand van die probleem van toksien en antitoksien van tetanus. Daar word dan aan die hand gegee watter navorsing gedoen moet word ten einde die verskillende probleme in verband met die berekening van tetanusserums, die inwerkingswyse van die toksien en die eienskappe van die antitoksien op te los.

Navorsing wat deur Llewellyn Smith gedoen is, het bewys dat die vergelykende berekening van tetanusantitoksienmonsters beïnvloed word deur die toksien wat gebruik word, die soort proefdier wat gebruik word en die roete van die inspuiting. Werk wat deur Petrie gedoen is, bewys dat die ru tetanustoksien, beide as immuniserende antigeen of as proeftoksien, beskou moet word as mengsels van die primêre toksienmolekule en die antigeenvariant daarvan in wisselende verhouding. Insgelyks bestaan preparate van tetanusserum uit mengsels van die ooreenstemmende antitoksiene. Verskille in die wederkerig neutraliserende affiniteite van hierdie bestanddele in 'n reagerende stelsel verklaar die verskille in die titer van tetanusserums wanneer verskillende proeftoksiene vir die berekening gebruik word. Verskille neem toe met die ouderdom van die kweking waaruit die toksien afkomstig is.

Die wisselende samestelling van tetanustoksien en die veelvuldigheid van teenliggame in antitoksiene maak dit moontlik om die moeilikhede te verklaar wat by die standaardiseering van tetanusantitoksien ondervind word. Hierdie teorie verklaar egter nie waarom die resultate wat verkry word in so 'n groot mate verskil nie na gelang die berekening van titers met muise of marmotjies gedoen word. Petrie het verskeie teorieë as verduideliking van hierdie verskynsel aangevoer.

Die verskille wat by titrasies opgemerk word, kan ook verklaar word deur die ongelyke verdeling van teenliggame in die verskillende dele van die globuliene van die perd. Navorsing in verband met die antitoksien vir witseerkeel dui daarop dat verskillende dele van hierdie globuliene op verskillende stadiums van immunisering teenliggame kan dra; daar sou verwag word dat

1. Bull. World Hlth. Org., 1949, **2**, 59.

EDITORIAL

TETANUS TOXIN AND ANTITOXIN

In a memorandum from the Department of Biological Standards, National Institute for Medical Research, London, submitted to the Expert Committee on Biological Standardization and published in the *Bulletin of the World Health Organization*,[1] an account is given of the present status of the problem of tetanus toxin and antitoxin. There follow suggestions for research which should be undertaken in order to solve the various problems related to the assay of tetanus sera, to the mode of action of the toxin and to the properties of the antitoxin.

Research carried out by Llewellyn Smith has demonstrated that the comparative assay of samples of tetanus antitoxin is influenced by the toxin used, the species of test-animal and the route of injection. Work undertaken by Petrie leads to the conclusion that crude tetanus toxins, whether used as immunizing antigens or as test-toxins, are to be regarded as mixtures in varying proportions of the primary toxin molecule and of an antigenic variant of this. Preparations of tetanus serum likewise consist of mixtures of the corresponding antitoxins. Differences in mutual neutralizing affinities of these components in a reacting system account for the discrepancies in titre of tetanus sera when different test-toxins are used for the assay. Variations increase with the age of the culture from which the toxin comes.

The varying composition of tetanus toxin and the multiplicity of anti-bodies in antitoxins make it possible to explain the difficulties encountered in standardizing tetanus antitoxin. However, this theory does not explain why results obtained vary so much according to whether the assay of the titres is made on the mouse or on the guinea-pig. Petrie has put forward various hypotheses as an explanation of this phenomenon.

The discrepancy noted in titrations could also be explained by the unequal distribution of antibodies in the various fractions of the horse globulins. Research on diphtheria antitoxin suggests that at different stages of immunization different fractions of these globulins

1. Bull. World Hlth. Org., 1949, **2**, 59.

die fisiese eienskappe van sulke dele heeltemal sal verskil.

Verdere studie behoort aan baie van hierdie belangrike aspekte gewy te word. Die bestek van die navorsing in verband met toksien, antitoksien en die proefdier kan miskien uitgebrei word.

Juiste gegewens oor die lokale inwerking van senuweegif op senuwee-spiergeleiding sal veral nuttig wees aangesien dit moontlik sal wees om nuwe metodes vir die berekening van toksien en die raming van sy inwerking in die vooruitsig te stel. Baie van die onlangse werk wat op verskillende oplossings dui, word opgesom.

'n Kritiese ondersoek van die teenliggaamdraende dele van globulien kan in die geval van 'n aantal serums gedoen word deur elektro-foretiese en chemiese metodes wat gekorreleer word met die muis-marmotjieverhouding, die dissosiëerbaarheid, die snelheid van uitvlokking ens. Laasgenoemde toets sou gegewens kan verskaf oor die relatiewe waardes van toksiene en antitoksiene.

Indien die navorsing wat in die geval van toksiene en antitoksiene aan die hand gedoen is, gelyktydig met muise en marmotjies gedoen word, kan dit lig werp op die verskille tussen die twee.

Ten slotte word in hierdie memorandum beginsels uiteengesit vir die vervaardiging van 'n stabiele toksoïed waarmee 'n toksoïed deur aluin gepresipiteer (APT) berei kan word.

may carry antibody; such fractions would be expected to have quite different physical properties.

Further studies should be devoted to many of these important points. A wider range of research might be attempted with regard to toxin, antitoxin and the test-animal.

Precise data on the local action of neurotoxin on neuromuscular transmission would be particularly useful, as it would be possible to contemplate new methods of assaying toxin and of estimating its activity. Much recent work suggesting various solutions of this problem is summarized.

A critical investigation of antibody-bearing fractions of globulin in a number of sera might be attempted by electrophoretic and chemical methods, correlating with the mouse:guinea-pig ratio, the dissociability, the speed of flocculation, etc. This last test could furnish data on the relative qualities of toxins and antitoxins.

Research suggested for toxins and antitoxins, if applied to mice and guinea-pigs, in parrallel, might elucidate the differences between them.

Finally, principles are set forth, in this memorandum, for the production of a stable toxoid with which an alum-precipitated toxoid (APT) could be prepared.

SOME RECENT CONTRIBUTIONS TO NEUROLOGICAL PROBLEMS*

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The day of descriptive neurology is over. The work of men such as Charcot, Dejerine, Erb and Gowers put neurology in a paradoxical position in that disorder after disorder was lifted out of the jumble of mysterious and miscellaneous disease, but despite its recognition and accurate description almost every such anomaly remained insoluble both as regards its origin and the treatment necessary to resolve it. Thus there was at the sides of these great neurologists of the nineteenth century the thorny jibe that their speciality, although of fascinating interest, admitted no therapeutic solution. The work of Broca, Wernicke and Hughlings Jackson, to mention only three names, had indeed pointed a way to the understanding of many of the causal factors in neurological disorders, but as a general rule collection and description of clinical material remained the goal of the neurologist.

This was certainly a very important and necessary contribution to medicine but to-day there has been a shift of emphasis, and although there is still much to describe and new syndromes to discover, the stress has fallen on a better understanding of the anatomical, physiological, and psychological implications of disease and on the possible steps for its prevention and cure. In this respect the neurologist is very much dependant on the biochemist, the physiologist, the geneticist and the pathologist, and he is probably more closely linked with his surgical colleague than a physician in any other speciality. This connection is no irreversible drift in which the patient is wafted like a twig on the Gulf Stream from Mexico to Iceland, but a close liaison between two departments calling for a great nicety of judgment and a sharing of experience.

The present position of neurology thus necessarily owes much to the laboratory worker and to the surgeon, so that any review of this position must encroach on domains outside that of the former descriptive neurologist. As Sir Charles Symonds said recently it would be pleasant to limit oneself to telling stories, like those of Sir John Mandeville, of unicorns and two-headed men, but the neurological counterparts of these stories have been so well told, as for instance in the old numbers of the Medical Record of the 1870's, that they would be spoiled in the retelling although they might still be instructive. The Thomists were charmed by arguments concerning the number of angels that could be accommodated on the point of a needle, but we, as neo-

*This paper was read at the Medical Congress held at Cape Town in September 1949.

Jacksonists, must seek a more practical use for the needle. It is the aim of this paper to review some of the patterns being stitched by the busy needles of research workers today. A recent and readily available paper by Symonds on reorientations in neurology somewhat limits the scope of this present review.

PROLAPSED INTERVERTEBRAL DISCS

The story of sciatica might well be taken as an illustration of how necessary it is for the physician and surgeon to work together. From the earliest times sciatica has been a scourge to mankind, limiting the activity of the most active and making miserable the existence of the sedentary. The cause of this wretched condition was a matter of speculation. Burton mentions the parson's wife who had it 'wished on to her' in the year 1607; and 300 years later constipation, fibrositis, and damp grass were considered to be frequent causes. In 1934 Mixter and Barr elaborated the clinical syndrome of prolapsed lumbar intervertebral disc, low backache, and sciatica. Other workers, particularly Love and Walsh and Dandy abundantly endorsed their theory and by 1940 many surgeons were enthusiastically removing lumbar discs. Two years later the preliminary enthusiasm began to wane and, although the experience of surgeons differed, opaque myelograms began to be extensively used and operation was largely determined by the findings after the injection of lipiodal into the thecal space. It soon became apparent that X-ray findings were not required and a careful assessment of the story and the signs was sufficient guide to the surgeon to enable him to locate the disc. This seemed a happy and satisfactory state of affairs but by the end of the war it was evident that many patients, from both civilian life and the services, were relapsing or not improving after their operations, and if a second operation was performed another prolapsed disc was often found. Falconer has shown that when one disc has become prolapsed the likelihood is that there is at least one other also protruding from its normal position between the vertebrae, and now once more opaque myelography is thought to be essential in determining which disc or discs are responsible for the symptoms. But the story does not stop here and the discovery of the autonomic ganglia-blocking properties of tetra-ethyl-ammonium has led to the attempt to block the lumbar ganglia in the belief that in cases of prolapsed lumbar intervertebral disc many of the painful sensory impulses travel via the sympathetic chain. The work of English and Spriggs in this respect is very suggestive—in 11 cases of prolapsed lumbar discs they injected 0.3 grm. of tetra-ethyl-ammonium intravenously and in eight cases obtained relief from pain for up to 28 days; in two cases only partial relief was obtained and one case was no better. Thus the clock has gone the full round, and from plasters and analgesics we have passed to surgery and now once more have the promise of a medical approach to the problem; not that the medical approach was ever lost sight of, for no set of signs or symptoms could be taken as indicating a purely surgical solution, but in each case the question of rest, social circumstances and future activity had to be carefully assessed before submitting the patient to the operating theatre. The question was always one demanding close co-operation between physician and surgeon.

TETRA-ETHYL-AMMONIUM

This particular chemical, tetra-ethyl-ammonium, calls for some comment as it and its related compounds promise to be of considerable interest and use to the neurologist. Lyons and his colleagues drew attention to the fact that tetra-ethyl-ammonium like other quaternary ammonium compounds, has a paralysing nicotinic-like action. In animals it caused a prompt fall in blood pressure, but experiments showed that this was not due to a central action nor to direct action on the blood vessels, and because of this it was assumed that the site of action must be the sympathetic ganglia. Without going into the details of the experiments which seem to bear out this conclusion, one finding might be mentioned that seems to be relevant—as one would expect, if the theory is true, the action of the compound when injected after the removal of the stellate ganglion is quite different in its effect on the heart rate from its action when this ganglion is intact, and this is the case.

In Man tetra-ethyl-ammonium is administered as the bromide or chloride compound. A 10% solution seems to be most satisfactory and this will withstand autoclaving. It has been used in a number of conditions—hypertension, periperal vascular disease, where it is particularly useful in relieving intermittent claudication, and in intestinal colic. But to the neurologist its use in causalgia of various types, and in post-herpetic neuralgia is of particular interest. Its action in alleviating pain in prolapsed intervertebral discs is remarkable and suggests that either the pain travels via the sympathetic chain and is blocked by the drug or else some vascular change occurs in the compressed roots which leads to lessening of the pain.

MYASTHENIA GRAVIS

In quite another field the co-operation of the surgeon and physiologist has gone a considerable way towards the solving of one of the major mysteries of medicine—that of myasthenia gravis.

Castleman and Norris in a recent review of their own cases and those in the literature, found that in 330 cases of myasthenia in which the pathology of the thymus had been studied there were 97 with thymomas. This figure of 30% is probably too high and the authors think that their own figures, and those of Keynes in London, and Good in the Mayo Clinic, of 10-15% are probably more accurate in accounting for the number of thymomas occurring in myasthenia gravis.

The symptoms in the thymoma cases are generally more rapid than in non-thymoma cases—50% of them have symptoms for less than a year, whereas in non-thymoma cases only 30% have symptoms for a year or less. Although myasthenia occurs much more often in the female than in the male, thymomas are slightly more frequent in the male, but this is possibly because of the age distribution of the tumour. In the non-thymoma cases the thymus is hyperplastic, and lymphoid germinal centres are found in the medulla of the gland.

The outcome of operation in thymoma cases is not very encouraging. In 31 operable cases of thymoma found in the literature, one is apparently cured, three are improved, two are unchanged and the rest are dead. But in the 185 non-neoplastic cases, 86, or 46.5% have had satisfactory results after operation.

As mysthenia is a disease of remissions it is not to be wondered that many prefer non-surgical measures of treatment. The early promise given by di-isopropyl-fluorophosphate (D.F.P.) has not been borne out and it is probably less satisfactory than neostigmine. On the other hand tetra-ethyl-pyrophosphate (T.E.P.P.) has a more powerful anti-cholinesterase action, and Burgen and others have shown that 10 mg. by mouth were as effective as 100-150 mg. of neostigmine, and its duration of action was 24-48 hours although in clinical use 8-12 mg. are required in two-three daily doses. There is no doubt about the value of T.E.P.P. in treatment but in assessing it one should remind oneself of the story told by Walshe of the patient he saw in 1920, to whom he gave the then fashionable treatment for myasthenia of raw-beef sandwiches: the man recovered and was next seen in 1942 when he relapsed when working as a fireman during the London blitz and developed symptoms of severe myasthenia which did not respond to prostigmine.

The use of D.F.P. does not however rest with myasthenia gravis alone. As it produces an irreversible inhibition of cholinesterase and consequent accumulation of acetylcholine, it was used in rabbits to study the effect on the E.E.G. of any acetylcholine that might be released within the cortex as Feldberg had already shown that acetycholine was used in the transmission of impulses within the central nervous system. The result of this experiment was that high amplitude waves appeared over the cortex on the injected side and later spread to the opposite side, the discharges lasting for about an hour.

Beckett and Gellhorn found that the amplitude and grouping of cortical action potentials was enhanced by eserine and diminished by cholinesterase and that suppressor areas could be excited by the local application of eserine and acetylcholine. The most recent work shows that eserine intravenously or locally, prostigmine intravenously, or mecholyl locally will produce abnormal 'convulsive spikes' on the E.E.G. indicating that the acetylcholine-cholinesterase mechanism plays an important part in the processes underlying the cortical activity which gives rise to convulsive phenomena. Although it is a far cry from myasthenia gravis to epilepsy it is of absorbing interest that both seem to be linked with disturbances of the acetylcholine-cholinesterase mechanism, the one peripherally and the other centrally. Symonds has pointed out the importance of the acetylcholine-cholinesterase mechanism being the possible mode of transmission of impulses within the central nervous system; he drew attention to Grobe's work on human volunteers and the wide implications this may have in the field of psychosomatic medicine. Grobe gave daily injections of 1 to 2 mg. of D.F.P. for 3-4 days with marked alteration in the E.E.G. of 17 out of 23 volunteers; this electrical abnormality could be restored in a few minutes by the intravenous injection of 1.2 mg. of atropine. But the findings which from a clinical point of view are so startling are the observations made on 60 normal subjects who were given D.F.P.—this usually resulted in symptoms which are given in order of frequency as 'excessive dreaming, insomnia, jitteriness and restlessness, increased tension, emotional lability, subjective tremulousness, nightmares, headache, increased libido, giddiness, drowsiness, paraesthesiae, mental confusion, visual hallucinations, tremor and pains in the legs'. As Symonds says: 'It is possible that the illness now known as endogenous depression may depend on some analagous biochemical phenomenon. It is an illness which may begin suddenly and last for a very long time, with spontaneous complete recovery, and, as we now know, can be reversed by crude stimulation of the brain by electric current. It may be precipitated by physical happenings—fatigue or intoxication—in susceptible persons. The factor of heredity is of undoubted importance. May we here have an error of inborn metabolism yet to be discovered comparable with that which is responsible for the symptoms of porphyria?'

PERIODIC PARALYSIS

The emphasis has shifted in many disorders from structural change to disorders of transmission of the nervous impulse. Gass and others have pointed out that in periodic paralysis although the most obvious changes are the fall in serum potassium and phosphorus levels, the actual level of the serum potassium does not seem to be the crucial point in the production of the paralysis as levels as low as 7.2, 8.5, and 9.4 mg.% have been produced in diabetes after the injection of insulin without any production of paralysis. Danowski has postulated a shift in the intracellular potassium but his work was largely based on inference. Indeed the problem of where the potassium goes to in the paralysis is unsolved—it is not excreted in the urine or faeces, and in fact its excretion rate actually falls during the period of paralysis. It has been supposed that the potassium might be stored in the liver but using radio-active K^{42} in a patient the Geiger-Mueller counter showed much higher readings over the head than over the liver.

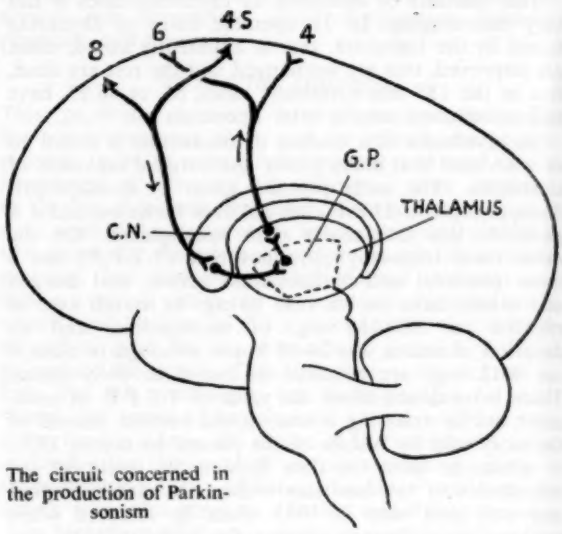
Transient muscular paralysis with E.C.G. abnormalities compatible with potassium intoxication have been reported by Finch, and by Symonds who gives some details of a case shown to him by A. M. Harvey. Finch's two cases had renal failure with transient flaccid paralysis, and Harvey's case had a progressive flaccid paralysis of the limbs and trunk with renal failure consequent on obstruction of both ureters by neoplasm. These cases led Symonds to remark on the resemblance between them and Landry's paralysis, examples of which as a rule have no demonstrable pathology. Almost exactly similar cases have been reported with low serum potassium in renal failure so that the problem becomes even more obstruse. Brown, Currens, and Marchand have reported two cases in this category, the first of whom had an ascending paralysis that responded to 2 grm. of potassium chloride four hourly, and the second who had two attacks of

weakness and stiffness of the jaw and one of generalised weakness which recovered without administration of potassium. In another case, reported by Holler, the patient, a diabetic, developed paralysis of the respiratory muscles after the injection of insulin, and responded dramatically to potassium chloride.

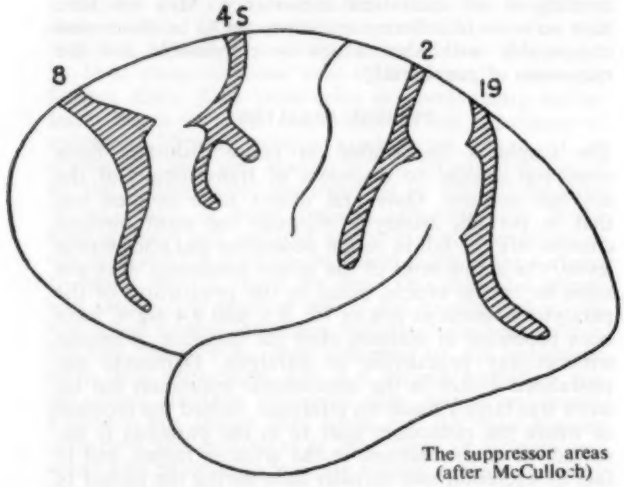
The problem of these paralyses remains unsolved, and though it is evident that the weakness results from some biochemical upset and that potassium is a link in the chain, it is by no means certain that the potassium disturbance is the only or even the main disorder.

ANATOMICAL CONSIDERATIONS

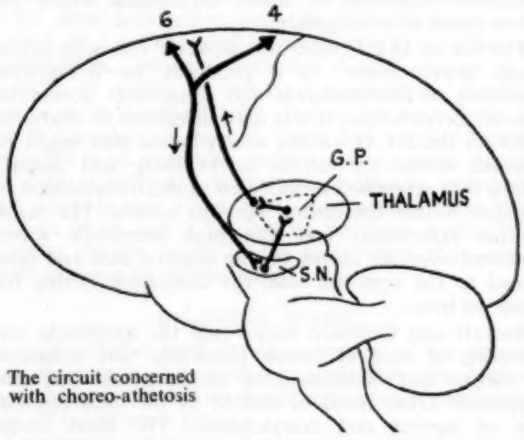
By no means all neurological research is being directed along the lines just indicated, and as was stated at the beginning of this paper there is still much to be learned about the structure of the nervous system. The so-called 'extra-pyramidal system' and the disorders attributed to its disease have for long been subjects for heated disputes. The numerous contradictory findings in the experimental and pathological reports have tended to make matters less rather than more clear as time went on. The work of the comparative anatomists, however, in dividing the basal ganglia into two main systems, the neostriatum, consisting of the caudate nucleus and putamen, and the palaeolstriatum embracing the globus pallidus, has been of considerable help in the understanding of extra-pyramidal disease. It is well established that the cerebral cortical connections with the striatum are much wider than was originally thought and include the supressor areas in the frontal and parietal regions, the premotor cortex, and even the motor cortex (area 4). The description by Dusser de Barenne of special cortical areas known as 'supressor areas' has led to interesting results which cannot be reviewed in detail, but as an example of the surprising



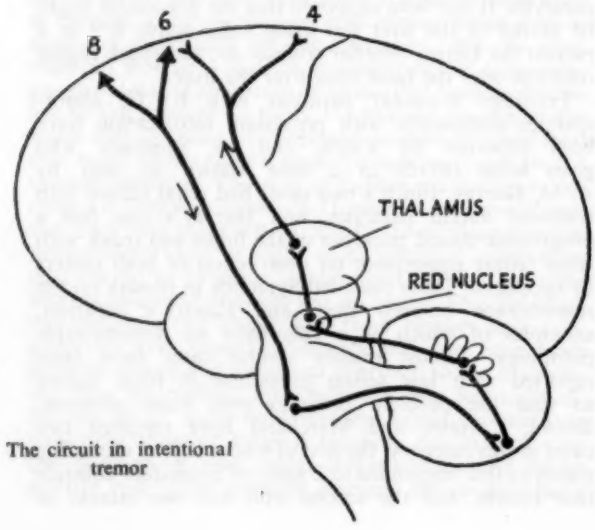
The circuit concerned in the production of Parkinsonism



The suppressor areas (after McCulloch)



The circuit concerned with choreo-athetosis



The circuit in intentional tremor

type of finding one might mention the fact that stimulation of area 4s inhibits spontaneous electrical activity in area 4 and abolishes contractions elicited from area 4. Admittedly most of the work on supressor areas has been carried out on animals, nevertheless the inferences are strong that similar regions exist in Man and indeed Garol and Bucy have presented evidence to this effect.

Bucy has postulated the presence of various circuits which include the basal ganglia and the cortex, and he has attempted to explain the development of various kinds of abnormal movement on the basis of interruption of these circuits. In general these circuits pass from the precentral motor cortex (areas 4, 6 and 8) to subcortical structures and back again to the cortex. To quote Brodal: 'The anatomical presence of such circular pathways is well established although many details are not known'. Most convincing appears his explanation of the intention tremor observed in lesions of the cerebellum, the brachium conjunctivum, and the red nucleus. The circuit involved is as follows: The fronto-pontine tract—the ponto-cerebellar fibres to the cerebellar cortex—the cortico-nuclear cerebellar fibres to the nucleus dentatus—the brachium conjunctivum passing from this nucleus to the red nucleus and thalamus—the thalamo-cortical projection passing from the nucleus ventralis lateralis to areas 4 and 6, from which the fronto-pontine fibres originate. Any lesion interrupting this circuit will abolish the inhibitory influence of the premotor cortex, and discharges passing through the efferent systems become abnormal and voluntary movements tremulous'. The existence of such a circuit would certainly explain, amongst other things, the 'cerebellar' signs that are at times seen so clearly in frontal lobe lesions.

Choreo-athetosis is thought to be due to the interruption of another circuit which consists of the following links: Corticofugal fibres from the supressor areas 8 and 4s to the striatum—strio-pallidal fibres to the pallidum—pallido-thalamic to the anterior part of the ventrolateral nucleus of the thalamus—thalamo-cortical fibres to the areas 6 and 4. This circuit is also thought to have an inhibitory effect on the motor cortex and its interruption results in abnormal discharges which give rise to choreo-athetotic movements.

In Parkinsonism the damaged neuronal circuit is one which runs from areas 4 to 6 to the substantia nigra and then on to the pallidum; from this to the ventrolateral nucleus of the thalamus and then back to the precentral cortex.

This outline is a simplified picture of the circuits as Bucy imagines them—if they exist they almost certainly impinge on other circuits not yet discovered and the complexity of their interlacing explains why surgical interference is so unsatisfactory in dealing with any of the three types of abnormal movement that have just been mentioned.

It is remarkable that although Egaz Moniz introduced prefrontal leucotomy in 1936 and many thousands of patients have been subjected to this procedure since then, that there is still so much to learn concerning the relative importance of the various projection systems arising in the frontal lobe. Meyer and others concluded from a study of eight brains at the Maudsley Hospital that the anterior and posterior parts of the cingulatory gyrus is connected with the antero-medial and antero-ventral thalamic nuclei respectively, and Cairns in a personal report has said that he is removing the anterior part of this gyrus now instead of doing prefrontal leucotomies. The same workers at the Maudsley have noted the connection of the pars magnocellularis and pars parvicellularis of the dorsomedial thalamic nucleus with the medial and lateral halves respectively of the orbital surface of the prefrontal area (areas 12, 11 and 47); and Fulton has commented, on the basis of leucotomies in monkeys, that area 13 of Walker on the medial surface of the orbital region is an area to avoid until we know more about the effects of its destruction. As regards the indications for and the results of prefrontal leucotomy these matters lie outside the scope of this paper: there is a great deal of ill-controlled work readily available in the literature but precise judgment is not yet possible.

In another field far more inaccessible to experimental study there are fascinating glimpses of the interrelationship of structural alteration and modification of behaviour. The changes in mood, character and interest that occur after encephalitis lethargica are well known and in this condition the brunt of the damage falls on the brain stem. Bailey recently drew attention to behaviour disturbances in four cats after injuries to the brain stem, and from this he went on to point out how little we know of the minute histology of the human brain-stem and how, because of changes taking place in the cells within a few minutes of death, we are unable to use the ordinary post-mortem specimens for anything other than the study of gross changes. It is of interest to recall briefly Bailey's story of the four cats. In the first animal a minute bilateral lesion was made in the ventromedian nuclei of the hypothalamus, and the normal friendly cat became transformed into a snarling vicious beast. In the second cat the periaqueductal grey matter was destroyed by means of a flexible electrode introduced through the fourth ventricle and this cat was made akinetic and mute. In the third cat a small lesion was made in the interpeduncular nucleus and this animal became so obstinately progressive that it would turn aside for no obstacle and would not stop until it fell exhausted. In the fourth animal a small bilateral lesion was made just above and posterior to the mamillary bodies and this cat became cataplectic, remaining in any position imposed upon it, but it might, if persistently irritated, suddenly turn and make a brief but fierce attack on its tormentor before resuming its cataplectic state. Thus if we may be excused the liberty of a fanciful investiture of human behaviour onto that of a cat, these four experiments produced a homicidal maniac, a retarded and withdrawn creature who did not show the emotional response appropriate to the situation, an obsessional maniac, and a cataplectic schizophrenic. These reflections are not meant to be taken too literally but it is possible that there is more hidden in the brain stem as regards the fundamental basis of personality, than there is in the much larger and more easily studied frontal lobes.

Other work which may lead towards revelations as

regards behaviour abnormalities is that of Mellanby who showed that dogs fed on flour which had been subjected to the 'agene' process of bleaching with nitrogen tetrachloride developed 'hysteria' and convulsions. This work has not been confirmed in man but Silver and his colleagues fed dogs on a diet which was adequate in all respects except that it contained 75% of agenesed flour. Seventy-five dogs and six monkeys were used as controls and they showed no clinical or electro-encephalographic abnormality, but in the experimental animals, after three months there were changes in behaviour, so that fierce animals became docile, and shy or friendly animals became vicious, and the E.E.G. showed changes resembling that of epilepsy in humans. Whatever may be the outcome of these researches it is interesting to note how the biochemical vies with the surgical and pathological method of exploration into the vagaries of mood and conduct.

MIGRAINE

It might be appropriate to round off this brief survey with reference to one of neurology's oldest problems—that of migraine. Migraine was known even before the days of Galen and it remains one of the commonest and most troublesome complaints that the physician is asked to deal with. The theories concerning its nature are innumerable, and many of them have been listed and discussed years ago by Riley: it may well be that one of the reasons for the failure of ergotamine tartrate in many cases is, as he suggests, that not all the migrainous headaches are due to vasodilatation, but that vasoconstriction alternating both in time and in individual vessels at the same time may cause some headaches. Furthermore there is good evidence to show that true migraine is often mistakenly identified with other unilateral, periodical headaches. The surgical attack on migraine includes stripping the carotid artery, injecting the gasserian ganglion and cutting the greater superficial petrosal nerve and cutting the temporal or middle meningeal artery. But none of these procedures is satisfactory. Of medical measures the new dihydro preparation of ergotamine is promising but Horton's method of desensitisation probably gives the best promise of success to date. The probability is that here also as in so many other neurological conditions the answer will be given by the biochemist and physiologist, although only a very small fraction of the answer is at hand at present. Why, for instance, do only some migrainous subjects develop typical attacks with scotomata and hemicrania and paraesthesia during periods of oxygen lack? Why do paraesthesia and headache appear some on the same side as each other and sometimes on opposite sides? What is the meaning of the relationship between the perfectionist obsessional type of personality of the patient with classical migraine, and the superficially happy-go-lucky character of the patient with the so-called 'petrosal neuralgia'?

These questions like many of the other questions raised in this paper remain to be answered and I have not attempted to answer them any more than I attempted to answer the problem of potassium and paralysis, but my excuse is that the paper is entitled Some Contributions to the Problems of Neurology, and not The Answers to these Problems.

INTERNAL PODALIC VERSION*

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By Internal Podalic Version is meant that operation whereby any representation is converted, by intra-uterine manipulation, into a breech—the cervix being sufficiently dilated to permit the passage of a hand. This operation is probably the oldest operative obstetrical manoeuvre known and was certainly practised in mediaeval times and probably centuries before. It was known not only to reputed Medical Practitioners, but also to midwives; as evidence of this, one need only refer to Siegemundin's manoeuvre which is used to this day and was first described by her while she held the position of Court Midwife to the Electorate of Brandenburg.

If any excuse is necessary for the production of this paper then the plea is the neglect which Internal Version has suffered. It is felt that the manoeuvre is the most useful single obstetrical operation, and that its value has been disregarded on account of the more frequent use of the forceps on the one hand and because of the relative and apparent ease with which Caesarean Section may be performed on the other. Not only have our modern practitioners less regard for 'turning' than of old, but our teachers appear to be of the same apinion. No doubt this first state of affairs is dependent upon the second. Every undergraduate student knows that in his viva voce midwifery examination he is likely to be asked to apply the forceps to a doll in a phantom; he also knows that he need know nothing whatsoever about the technique of Internal Version. The influence that Caesarean Section has had upon the frequency with which Version is performed is due to the fact that the former is usually an easy operation and very little judgement is necessary for its perfarmance. Version, on the other hand, requires a nice judgment and experience

*This paper was read at the Medical Congress held at Cape Town in September 1949.

of Breech delivery; in a properly selected case, version is easy, but the delivery of the breech may require a lot of skill. The introduction of the axis-tractor has enabled the forceps to be applied at higher levels with more safety than was previously the case, but a difficult high forceps delivery is a very poor substitute for an easy Internal Version and extraction. There is no doubt that the higher the application of the forceps, the greater the danger of damage to mother and child; exactly the reverse holds good for Internal Version. Ordinarily, if proper indications for the application of forceps are enforced the two operations are complementary rather than antagonistic to one another. These facts are not sufficiently stressed and the forceps enthusiast adopts the attitude that the only alternative to his instrumental delivery is a Caesarean Section and this he intends to avoid at all costs. It would seem that, mainly from habit or custom, the average person prefers to perform a Caesarean Section or forceps delivery to an Internal Version. This is an unsatisfactory state of affairs and is one of the reasons why this paper is presented to your notice. The secret of employing version successfully, is to use it as a method of choice and not as an alternative to some other operative procedure which has already failed and jeopardised the chances of both the mother and the child. It is not for a moment suggested that Internal Version is a panacea for all obstetrical ills, nor does the author subscribe to the radical views of Potter and his satellites, but it is felt that there is a definite place for version as an operative measure and that the scope is far wider than is generally thought. It is hoped that both those who teach and those who practise the Art of Obstetrics, will regard more favourably this very valuable, but much neglected, weapon in the armamentarium of the attendant in the lying-in room, particularly as it is a weapon which requires nothing other than a pair of clean hands for its use and as it has no peer as a means of rapidly expediting a delivery.

Internal version may be used alone as a means of correcting a malpresentation, or it may be followed up by an extraction of the child. The latter procedure is always preferable if it is feasible as the risk to the child is less. Bearing this in mind, the performance of version should always be delayed as long as possible in order to allow of a successful extraction. In the descriptions and discussions that follow, it is always presumed that it is possible to carry out extraction of the child, but it is realised that this is not always the case.

CONDITIONS TO BE FULFILLED BEFORE VERSION

Before considering the indications or technique of Internal Version, it is necessary to state quite plainly the conditions which must be fulfilled before version can be contemplated.

(1) *The Cervix.* The cervix should be fully dilated, or fully dilatable. At the risk of being accused of sacrilege, it is deliberately stated here that under certain circumstances it is permissible to perform a version and extraction with the cervix still palpable. Any experienced obstetrician will freely admit that on numbers of occasions it has been necessary to carry out this operation with a rim of the cervix still palpable—for example in prolapse of a pulsating cord—and has been surprised at the ease with which delivery was effected. If the cervix is still present, provided the amount is small and is thin and the consistency elastic, then it may be ignored. With regard to this point, it is obvious that even in normal labour, a cervix does not necessarily disappear completely as is usually taught; once it is dilated sufficiently to enable the presenting part to pass, uterine action forces the lowest part of the foetus through, regardless of whether or not complete dilatation has been achieved. This fact is well illustrated by footling and anencephalic presentations. In both, the foetus is held up at the shoulders because the bisacromial diameter is usually much larger than the presenting part which has already passed the cervix. In those abnormal presentations where the lowest part of the baby does not descend well into the cavity of the pelvis, such as in Brow presentation, it is doubtful if the cervix is ever fully dilated until just before the state of 'threatened rupture' of the uterus supervenes. Whether or not an incompletely dilated cervix is dilatable is a matter of the greatest importance and if there is any doubt about the matter, it is far better to err on the side of caution. The condition of the cervix is estimated by vaginal examination.

(2) *The Uterus.* The state of the uterus is undoubtedly the most important single factor bearing upon Internal Version. With it, to some extent, is bound up the length of the time the membranes have been ruptured; the duration of the labour *per se* has nothing whatsoever to do with the case. If the membranes are intact, or if they have ruptured, but the hind-waters have been retained, it is unlikely that an uterine contra-indication to version will be present. The uterus should be regarded in the same light as the cervix; either it must be relaxing well between contractions, or it must be capable of being made to relax when Internal Version is considered. Whether or not the uterus is relaxing between contractions can be ascertained by careful abdominal palpation. Whether or not the uterus can be *made* to relax can only be discovered after the patient has been deeply anaesthetised and no final decision should be made with regard to the feasibility of version, until this has been done. The only way of making the decision is to pass a hand into the uterine cavity. Naturally, this should only be attempted when it has been decided that version is the treatment of choice for the particular case under consideration. If a hand can so be passed up to the fundus with little difficulty, in most cases, this fact may be accepted as presumptive evidence of there being no uterine contra-indication to the performance of version. Conversely, if the exploring hand encounters difficulty in reaching the fundus on account of the tone of the uterus, version is most certainly contra-indicated.

(3) *The Pelvis.* The pelvis should be of such a size and shape as to permit of a vaginal delivery of a living child. This might appear a fatuous statement to make, but it is one thing to know that the pelvis should be adequate and quite another to prove it. Under ideal circumstances it should be possible to carry out an X-ray pelvimetry if this has not already been done; proper facilities are not always available and the obstetrician has to fall back upon his own estimation of the size

and shape of the pelvis on these occasions. In a parous woman, it is usually an easy matter, as an accurate history of the previous labours, with particular reference to the duration of the labours, size of the babies, methods of termination and the presence and degree of caput and moulding, will prove almost as valuable as a series of X-ray plates of the pelvis—perhaps even more so, as these items all take into account the factor of uterine action which the best X-ray plates in the world do not. There is, however, the elderly multipara who has developed Spondylolisthesis; her previous history may be most misleading—especially if there has been a long interval since the birth of the last baby. Even when X-ray pelvimetry is available, it is the duty of the operator to assess the size of the pelvis. It has already been mentioned that a vaginal examination should be made to assess the state of both the cervix and the uterus; at the same time, the pelvis should be investigated in the following methodical manner. Under an anaesthetic, the fore-pelvis is carefully palpated, particular attention being paid to signs of Rickets in the shape of bony nodules on the posterior surface of the symphysis pubis. The iliopectineal line should be followed round as far as possible with only the half-hand in the vagina; if this line is palpable for more than half its total length it is strongly suggestive of some reduction in the transverse diameter of the brim. The tilt of the sacrum should be noted and whether or not it is normally curved. Any flattening of the sacrum should be regarded with suspicion. The size of the sciatic notches can be gauged by roughly measuring the length of the sacrospinous ligaments; each ligament should allow two fingers to move freely between the last pieces of the sacrum medially, and the ischial spine laterally. A small sciatic notch has a short sacrospinous ligament and is highly suggestive of a male type of pelvis. The diagonal conjugate should be measured if the sacral promontory is palpable; the fact that it is not palpable in a deeply anaesthetised patient is a favourable sign. The sub-pubic angle is estimated by attempting to place three fingers side by side beneath the pubic arch. Finally, the intertuberous diameter may be measured directly with a sterile steel ruler.

(4) *The Baby*. The position of the baby must be accurately ascertained; this is a *sine qua non* of successful version and it must be outlined before any form of treatment is contemplated. The usual methods of diagnosis are employed, with particular stress upon careful abdominal palpation. In difficult cases it is of advantage to do this under anaesthesia before performing the vaginal examination. Vaginal examination is an adjunct to abdominal palpation and is essential in those cases where dystocia is due to a minor malpresentation of the head. It is important that this examination should be made as gently as possible; this axiom should always apply, but is particularly applicable where version is contemplated, because anything that is likely to increase the irritability of the uterus should be avoided at all costs. Rough vaginal examination with a tendency to push the presenting part back into the uterus is one of the main ways of irritating the uterine muscle. The hand should be placed in the vagina in order to obtain certain information and it should not be removed until all investigations have been completed. Nothing is more likely to make an easy version difficult or even impossible than a hand inserted into and removed from the lower segment many times. Not only does this interference prejudice the chances of successful version being performed, but it is completely fruitless. It is often done because the operator regards the vaginal examination as a matter of form and is uncertain of the information being sought. Before vaginal examination is attempted at all, a plan of campaign should be mapped out in order to avoid the mistake just described. If version is decided upon, it should be carried out forthwith if the conditions are favourable. Apart from the position of the baby, its size is of some consequence though not as important as the size of its head. Babies large enough to produce dystocia are usually very large and can be diagnosed as such. The common cause of an exceedingly large head is hydrocephalus; this should always be borne in mind and excluded when considering a baby as a possible candidate for Internal Version.

TECHNIQUE

The position of the patient is of importance and the operator should use whatever position he is accustomed to. There is no inherent advantage in Sims' position which was so popular in the last century. Generally speaking, it will be found that the dorsal cross-bed position is the most useful; it allows the anaesthetist full range of movement and makes the patient very accessible. It is a mistake to have the patient's legs fixed in stirrups; if assistants are available, one should sit on the bed on either side of the patient each holding a leg with the knee joints flexed to about 80° and the hip joints but slightly abducted and flexed not more than 60°. If there are no assistants present, the patient's legs may be supported in the position described, over the backs of two kitchen chairs. With the patient anaesthetised, the usual perineal toilet is performed—particular care being taken to empty the bladder completely. It is a great help to cover the abdomen with a sterile towel; this will enable the operator to palpate the abdomen after scrubbing up and thus time will be saved. Unless gloves extending up to the elbow are available, it is better to wear no gown, or else a gown with short sleeves. The bare lubricated arm is infinitely preferable to the arm covered by the conventional very bulky sleeve tucked into short gloves. The routine vaginal examination is made with a well-lubricated hand; the pelvis is assessed, the state of the cervix and uterus considered and the position of the child diagnosed. Internal Version having been decided upon, the examining hand—the right, if the operator is right-handed—is slowly, deliberately and very gently passed into the uterus. The presenting part is disregarded and merely gently brushed aside, pushing it back into the uterus as little as possible. The hand should be passed along the ventral surface of the child until either a knee or foot is reached—whichever is the sooner. In an easy version it is simple to reach and bring down a foot; in a difficult one it saves a lot of manipulation to bring down a knee. It matters little which foot or knee is brought down and it is better to bring down one only. The knee is differentiated from the elbow by the patella and the lack of sharp olecranon process; while the lack

of a thumb and the long heel distinguishes the foot. While the foot is being sought, it is of help if the second hand is used as counter-pressure on the patient's abdomen. Once the foot or knee is found, it is firmly grasped and the hand retreats by the way it came and in the same slow and deliberate manner. There should be no haste and no sudden pulling on the lower limb as it is brought down into the vagina. Not until this stage is reached should any attempt be made to extend the knee-joint if a knee has been brought down. In the average case, steady, but firm traction on the limb in a downward and slightly horizontal direction, causes the thigh and half-breech to descend into the vagina. At the same time, the head, which was probably in one or other iliac fossa, will rise up without any assistance. In unfavourable circumstances, the head may become fixed in its original position and it is then dangerous to apply excessive traction to the limb. In order to free the head, the abdominal hand should be used to lift the head out of its fixed position, at the same time slightly relaxing the traction on the leg brought down. If this fails, Siegemundin's manoeuvre must be carried out. This is simply a means of allowing the operator to apply traction to the leg brought down and at the same time to push up the offending head by intra-uterine manipulation. In the ordinary course of events, this is impossible, as two hands cannot occupy the vagina at the same time. Siegemundin's method of coping with this disability was to pass a fillet (a hair ribbon) around the knee or ankle; by this means it was still possible to pull on the leg and at the same time insert the other hand into the uterus and push the head out of its fixed position. Once the head is moved at all, slight traction on the fillet usually completes the version with ease. The application of the fillet may be difficult; the more the need for it, the greater the difficulty, as the more inaccessible is the leg. Hair ribbons are not as fashionable as they were in Siegmundin's day, but a length of two-inch gauze with a running noose makes an admirable fillet which does little damage to the limb. Once the head has been made to enter the fundus, the traction is continued in a downward direction. The second leg is usually extended, but need not necessarily be so. In any case, it should be ignored; if extension does exist, traction on the first leg should be augmented by digital traction on the second groin as soon as it becomes accessible. On no account should any effort be made to bring down the second leg; bitter experience has shown that this procedure almost doubles the risk to the baby. As soon as the whole breech appears, traction and rotation should be continued so as to direct the child's back towards the ceiling. There is no hurry about the delivery of the breech, in fact, it is imperative to act slowly and deliberately. As soon as the umbilicus appears, a loop of redundant cord should be hooked down. It is easier to manage the baby if it is covered by a sterile towel. Traction in a downward direction should be continued, the trunk of the child being firmly held with both hands. The body must be so rotated as to bring the bisacromial diameter into the antero-posterior diameter of the outlet. The arms should be ignored until the anterior axilla appears under the pubic arch. In order to achieve this result, it is important to draw the child's body almost vertically downwards towards the floor. The traction downwards may be facilitated by an episiotomy if the perinaeum offers any resistance. Whether or not the the anterior arm is extended, the traction should be continued until the axilla can be well seen. When this stage is reached, it is usually a simple matter to deliver the anterior arm with an index finger passed along the ventral surface of the arm, up to the bend of the elbow; the arm is then swept across the body of the child. Having delivered the first arm, by raising the body well up and by applying gentle traction, the posterior arm will often deliver itself. If it does not, it should be delivered as a posterior arm by using only an index finger to flex the arm and sweep it across the child's abdomen. The after-coming head should be delivered by whatever means the operator favours—including forceps. Personally, I always employ Burns' method and never forceps, as I have found the former simple and most successful and the latter unnecessary. Whatever method is used, the motto should be to 'hurry slowly' and to remember that supra-pubic pressure applied to the head is a vital necessity. The delivery and extraction of the child has been described in some detail deliberately; it is often the most difficult part of the operation. Generally, it is made difficult either by trying to bring down the second leg, or by trying to deliver the arms too soon. It is again stressed that it is easier to cope with the shoulders if the anterior one is delivered first. To achieve this, the child's body *must* be drawn well down towards the floor. Whatever the method of delivering the after-coming head, *supra-pubic* and not fundal pressure should be used. The latter is usually described in the text-books and is obviously a useless procedure. In those cases where the cervix is not quite fully dilated, it is as well to delay a few minutes after the delivery of the shoulders before attempting to cope with the after-coming head.

INDICATIONS

It must be stressed that Internal Version is not being put forward as a means of expediting a labour that is progressing normally, as is held in certain quarters. It is offered here as a safe and relatively easy means of coping with certain labours that are abnormal, so that generally speaking, either a malpresentation must be present, or else the normal mechanism of labour must have come to a halt at a level not lower than the ischial spines. The indications for the operation are numerous; there is no obstetrical operation with as many possibilities. Earlier on in this paper it was stated that the operation was the most useful single operation in the hands of the obstetrician. In order to stress this, it is easier to enumerate the contra-indications rather than the indications. The list is far shorter. The absolute contra-indications are two only, namely, any degree of contraction of the pelvis likely to prejudice successful vaginal delivery by any means, and secondly, the major degrees of placenta praevia. In every other obstetrical condition that comes to mind, providing always that the conditions are favourable, Internal Version may be used as a treatment with great success.

No one will dispute that any one of the complications associated with Transverse or Oblique presentations

are best treated by Internal Version if possible. This applies to a dead as well as a live baby. Prolapse of the Cord carries with it a high foetal mortality; this mortality is lowest if the accident occurs late in labour with a vertex presenting at the outlet. On these occasions either spontaneous delivery takes place, or it is possible to deliver the child rapidly with forceps. The next lowest mortality occurs in those cases where the presenting part is higher than the ischial spines and where rapid internal version and extraction can be performed. Face presentation with the chin tending to rotate into the hollow of the sacrum is an ideal condition for treatment by version, providing this can be carried out at the optimum moment—that is to say—the chin being not much lower than the ischial spines and the os fully dilated. The same applies to Brow Presentation where, with the diagnosis made, it is permissible to wait until the os is fully dilated before making any effort to cope with the situation. The point about corrective forms of treatment in these last two conditions is that they are not at all certain as the original malpresentation is always likely to recur. Internal Version does away with this possibility and terminates the labour. In Occipito-posterior presentation the place of version is limited. Most posterior presentations are corrected by nature; even if uncorrected, nature may still relieve the situation by delivery as P.O.P. There are certain cases, however, where nature fails to do either and the head fails to advance after it has reached the position with the sagittal suture in the transverse diameter of the cavity of the pelvis. If such a head had passed the ischial spines, the proper treatment would probably be rotation and delivery by Kielland's forceps, but if it has not reached this level and the conditions are fulfilled, version is a treatment to be considered. In certain cases of Contracted Pelvis, particularly that type of Flat Pelvis with a long transverse diameter, providing the exact size of the pelvis is definitely known, it is far easier to deliver the child as a breech than as a vertex and version, when the os is full, is indicated. In this type of case, the head should be delivered deliberately in such a manner as to allow the biparietal diameter to engage the true conjugate; Mauriceau-Smellie-Veit's method of dealing with the head should be the method of choice. In Twin Pregnancies, uterine action is often poor owing to over-distension of the uterus. Should an indication for delivery present itself, version should be considered. The second of Twins often may be delivered by version with advantage, immediately after the delivery of the first twin. This applies to those cases where the first twin was delivered by the efforts of Art with with patient anaesthetised. By doing this, Prolapse of the second cord and Transverse Presentation are obviated. Occasional cases of Lateral or even Marginal placenta praevia bleed very late in labour; these may be treated by Version if the conditions are suitable.

ANAESTHESIA

The anaesthetic for Internal Version is most important; it must be deep enough to cause the uterus to relax and at the same time it should affect the baby as little as possible. It is often taught that Deep Chloroform anaesthesia is the anaesthetic of choice. I think this is a mistake. Chloroform is a more dangerous drug than ether, but it is easier to administer to a woman in labour; therein lies the reason for the preference for chloroform. An indifferent anaesthetist is much more likely to produce relaxation (or death) with chloroform, but a skilled anaesthetist is able to produce the same relaxation with Gas, Oxygen and Ether with a far smaller risk to mother and child. Unfortunately, this anaesthetic requires an apparatus which may not be available and under these circumstances chloroform may have to be used. Cyclopropane is more toxic to the baby than either of the above, while Curare is quite unsatisfactory as it tends to produce further contraction of the uterus rather than the relaxation which is desired. The former increases the likelihood of apnoea in the baby.

From what has been said, the impression might have been conveyed that an effort was being made to substitute Internal Version for ordinary conservative midwifery. Such is far from being the case. It is felt that midwifery is becoming too radical; the Caesarean Section rate is rising alarmingly and too many high forceps are being applied. If the operation of Internal Version were to be thought of more often and regarded as a much less radical manoeuvre than either high forceps or Caesarean Section and preferable to both, I am sure a number of women would escape major surgical or obstetrical assaults. If but one Section or difficult forceps is so avoided, then the purpose of this paper will have been achieved.

A SURVEY OF WHEAT AND MAIZE CONSUMPTION IN BANTU URBAN AREAS (1949)

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Concomitant with the drift of Bantu people to the cities has come a change in their dietary habits.

Finding the lack of cooking facilities in the urban areas a problem, they tend to increase their consumption of the readily available prepared foods such as bread.

In an attempt to find out how far this dietary change has taken place in regard to the consumption of wheat and maize, a survey was undertaken in a number of the larger urban areas of the Union. Through the assistance of the local Medical Officers of Health, information regarding the quantity of wheat and maize

consumed daily by a number of families in each of these areas, was obtained on simple questionnaire forms.

Method of Survey. The Medical Officers of Health deputed some of their Health Inspectors and, where available, Social Workers, to visit families and obtain from them information concerning, the size of the family, and the weekly purchases of maize and wheaten products, prepared and unprepared, purchased both at home and at work

Information about the period of residence of the family in an urban area, and to what extent fuel constituted a problem, was also sought.

The Survey. A total of 2,561 families residing in 14 different urban areas in the Union, was surveyed, and the results are given in the following table:—

AVERAGE CONSUMPTION PER PERSON PER DAY OF MAIZE AND WHEAT PRODUCTS IN OUNCES AMONGST THE URBAN BANTU

Town	*Number of Families Surveyed*	*Wheat*	*Standard Deviation*	*Maize*	*Standard Deviation*	*Number of Years Resident in Area*	*Standard Deviation*
Alexandra Township	153	6·65	3·66	10·70	7·82	13·4	8·01
Benoni	100	9·04	5·11	16·71	7·83	21·13	9·50
Boksburg	34	4·99	2·16	5·99	4·73	11·65	6·26
Bloemfontein	100	9·28	5·71	8·83	5·20	29·70	12·64
Cape Town: Cape Flats	95	10·37	3·93	11·46	7·21	8·98	6·15
Langa	100	10·22	4·70	8·46	5·26	24·58	13·76
Durban	38	6·61	3·54	10·53	4·99	6·58	4·55
Johannesburg: E.N.T.	27	9·22	4·85	21·02	10·76	17·6	5·7
Moroka I	373	11·82	5·33	18·77	8·01	12·64	7·76
Moroka II	142	6·44	3·68	16·19	7·58	11·74	8·42
Orlando	471	9·99	5·40	15·62	8·92	16·2	8·55
Pimville	63	12·92	5·70	16·29	7·33	26·3	10·7
W.N.T.	109	9·45	7·55	18·59	10·18	16·5	7·4
Krugersdorp	101	6·63	4·53	13·12	5·86	18·41	11·77
Ladysmith (Natal)	100	8·09	4·83	13·20	7·02	19·41	15·19
Nigel	97	5·60	4·52	13·31	8·02	12·89	8·97
Port Elizabeth	102	12·68	6·78	12·97	8·00	25·13	15·62
Pretoria: Lady Selborne	156	5·85	3·05	12·40	5·56	14·25	9·40
Other Townships	100	6·23	4·80	13·32	8·98	19·63	12·01
Springs	100	9·86	4·69	14·32	10·45	16·86	7·88

Omissions. The figures for Vereeniging have been excluded because, in regard to the consumption of maize they are so high (31.80 oz. per person per day), that it cannot be accepted that they reflect the true individual consumption, unless much of the maize is being used in the preparation of kaffir beer.

Owing to a misunderstanding, East London submitted a budgetary survey instead of a wheat-maize survey and it has therefore not been possible to make use of their information. We would, however, like to pay tribute to Social Welfare Worker D. G. Bettison for the conscientious and detailed report submitted.

Previous Survey. For the purpose of comparison the average figures obtained in a previous survey entitled *A Study of African Income and Expenditure in* 987 *Families in Johannesburg, January-November,* 1940, which was conducted by Miriam Janisch, are given in the following table:—

INCOME AND EXPENDITURE IN 987 FAMILIES IN JOHANNESBURG, JANUARY—NOVEMBER, 1940

Bantu Townships Around Johannesburg	*Number of Families Included in Survey*	*Consumption per Man Unit per Day in Oz. (Average)*	
		Wheat	*Maize*
Eastern Native Township Orlando .. .. Pimville .. .. Western Native Township	987	1·66	10·04

Discussion. The consumption per person per day revealed in the present survey ranges from 4.99 oz. to 12.92 oz. for wheat, and from 5.99 oz. to 21.02 oz. for maize. In the four Bantu Townships surveyed by Miss Janisch in 1940, the present survey revealed an average consumption of 10.39 oz. of wheat, and 17.88 oz. of maize per person per day. This indicates an overall increase in the consumption of both cereals when compared with the earlier figures, but the most striking feature of the comparison is the relatively large increase in wheat consumption. As the average consumption of wheat in all the urban areas surveyed was 9.35 oz. per person per day, the average figure for the four Bantu Townships compared above is seen to be fairly representative of that for the whole of the survey.

This does not apply in the case of the average daily individual consumption of maize, which in these four townships is 6.71 oz. per person per day higher than the average for the rest of the areas investigated.

Before any inferences can be drawn from these

figures it must be explained that in the present survey the daily consumption is recorded in oz. per person, while in the previous survey it was expressed in oz. per man-unit. The effect of converting the figures of the present survey into man-units would be to increase the discrepancy. The inference, therefore, that the consumption of cereals generally, and of wheat in particular, has increased, still holds.

The whole-hearted co-operation of the Medical Officers of Health enabled this survey to be undertaken and tribute is paid to their enthusiastic efforts. Mention must also be made of the valuable assistance rendered by the Director of Census and Statistics and those members of the Staff of the Division of Nutrition and Health Education of the Department of Health who spent many hours analysing the data.

I am indebted to the Secretary for Health for permission to publish this paper.

ASSOCIATION NEWS : VERENIGINGSNUUS

THE MEDICAL GOAL*

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It has been customary, after a year of academic meetings and discussions, interspersed with business, on the occasion of the Presidential Address, to look at some wider and more general aspect of the medical field. This final act of addressing you as President I have approached with very considerable fear and trepidation. In discussion of the various problems that have arisen during the year and by contact both with the public and with colleagues, one has frequently wondered what is our medical aim or goal. I think that this might very well be the subject of my address to you to-night.

About 2,500 years ago it happened that the founder of Buddhism was struck by the sight of an impoverished ailing man. The Prince asked his charioteer, Channa:—

> And are there others, are there many thus?
> Or might it be to me as now with him?
> Great Lord! answered the charioteer, this comes
> In many forms to all men: griefs and wounds
> Sickness and tetters, palsies, leprosies,
> Hot fevers, watery wastings, issues, blains
> Befall all flesh and enter everywhere.
> Come such ills unobserved? the Prince enquired.
> And Channa said, Like the sly snake they come
> That stings unseen, like the striped murderer,
> Who waits to spring from the Karunda bush,
> Hiding beside the jungle path: or like
> The lightning, striking these and sparing those,
> As chance may send.
> Then all men live in fear?
> So live they, Prince!
> And none can say, I sleep
> Happy and whole to-night, and so shall wake?
> None say it.†

Primitive man was close to nature, but the fundamental fallacy of his medicine was its constant interference with nature. Health and disease was a constant conflict between the good and the bad spirits, each battling for victory. He was human enough to feel that he might neglect the good spirits which wished us no harm, but the evil spirits were another matter. The sick person was possessed of devils, and by some means these devils must be driven out. Thus by mystery and ritual and all manner of noise and incantation the sick person got no rest or quiet, for the disease demon must be allowed no peace.

By the time the Egyptians began to write about medicine the origin of the healing art was already forgotten in antiquity. Although the efforts of medicine to extricate itself from magic runs through the entire story from the dawn, in Egypt this separation was impossible, for the physicians were the priests, and the Gods were ever present.

In those days there was remarkable technical skill, as in the building of the pyramids, side by side with gross credulity. Although the Egyptians were masters of mummification, and dissected animals, they neither observed or dissected the human body, and so knew little anatomy.

Many Egyptian scrolls have survived three or four thousand years, and Egypt was undoubtedly the medicine centre of the ancient world.

From the Bible we read: 'And Moses was learned in all the Wisdom of the Egyptians'; and Jeremiah says in sarcastic vein: 'Go into Gilead and take balm, O virgin daughter of Egypt; in vain dost thou use many medicines; there is no healing for thee.'

Herodotus describes Egypt as the home of the Specialist. 'Medicine is practised amongst them on a plan of separation, each physician treats a single disorder and no more, thus some undertake to cure diseases of the eyes, others of the head, others again of the teeth, others of the intestines.' With such specialization it does seem remarkable that they produced a medicine so barren.

When we turn to the medicine of ancient Greece, it is the History of Herodotus which is the source of knowledge. He was a faddist, but he was also the teacher of Hippocrates, who has been called the father of modern medicine. The keynote of Hippocratism is gentleness—no harsh methods and no unnecessary meddlesomeness. We properly call him the father of modern medicine because:—

1. By demonstrating that disease was not dependent on supernatural causes, he emancipated medicine from magic.
2. By his case histories and bedside teaching he founded clinical medicine.
3. By insisting 'Nature heals, the physician is only nature's assistant', he gave medical practice its cardinal doctrine.
4. By his principles of the Hippocratic oath he gave medicine its ethical basis.

Prof. J. A. Ryle has extracted the following excerpts from the writings of Hippocrates because of their bearing in situations which may confront the physician to-day:—

1. Into whatsoever house I enter, I will enter to help the sick.
2. I urge you not to be too unkind, but to consider carefully your patient's superabundance or means. Sometimes give your services for nothing, calling to mind a previous benefaction or present satisfaction.
3. Physicians who meet in consultation must never quarrel. To be jealous is a sign of weakness.
4. As to diseases, make a habit of two things—to help, or at least to do no harm.
5. One must occupy oneself with facts persistently.
6. There are in fact two things, science and opinion; the former begets knowledge, the latter ignorance.

The most important medical authority of antiquity following Hippocrates was Galen, a Greek who worked in Rome 500 years later. He was an anatomist, an experimental physiologist and a surgeon who introduced the arterial ligature. He was the last of the Greeks. When he spoke no more, a darkness settled over Europe which was not be lifted for more than a thousand years.

It is generally accepted that modern medicine again dawned with the 19th Century. The last quarter of the 18th Century saw the surgeons finally liberated from the yoke of the physicians. In that period the Royal Colleges of Surgeons of Edinburgh, Dublin and London were all founded.

The abolition of pain during operations which resulted from the development of anaesthetics and the application of the discoveries of Pasteur by Lister which finally resulted in the aseptic technique were the two great discoveries of the century from which modern surgery has sprung. It was Lord

* Report of the address of the retiring President delivered at the Annual General Meeting of the Northern Transvaal Branch on 14 February 1950.
† Sir Edward Arnold in *The Light of Asia.*

Moynihan who said that the surgery following these discoveries had been characterized by the effort to make the patient safe for surgery.

In the last decade or two progress in modern anaesthetics and chemotherapy has so assisted the surgeon's art that it is becoming a therapeutic weapon of almost unapproached perfection. The thunderbolt of surgery, John Hunter, developed the pathology of the dead; any surgeon to-day may add his contribution to the pathology of the living.

The names of the great physicians who have contributed to the development of modern medicine in this same period are very numerous. I would propose to mention three:—

Edward Jenner's bi-centenary was celebrated last year. The discoverer of vaccination, he was and remained a country general practitioner. He never became a Fellow of the Royal College of Physicinas because he declined the trial of a Latin examination. That Parliament, in 1806, voted him a total sum of £30,000 is a fair tribute to the importance of his work.

Sir William Osler's centenary was celebrated last year. No medical man has left a greater mark on his generation. I feel I cannot do better than quote Prof. Sigerist: 'The history of the medical ideal is the history of human society. . . . The good physician was at all times the physician who felt himself bound by the medical ideal of his time. Men like Hippocrates . . . and Osler were therefore great physicians and will always occupy a special position in the history of medicine, for they came closest to the medical ideal of their time.'

Writing of the progressive character of medicine, Osler said: 'There seems to be no limit to the possibilities of scientific medicine. . . . Never has the outlook for the profession been brighter. Everywhere the physician is better trained and better equipped than he was 25 years ago. Disease is understood more thoroughly, studied more carefully and treated more skilfully. The average sum of human suffering has been reduced in a way to make the angels rejoice.'

This quotation from Osler is dated 1902. What of the breathtaking progress that has followed in the near 50 years since that time?

My third physician is *Prof. George R. Murray*, to whom I had the privilege of being House Physician. After research and observations in connection with cases of hypothyroidism, he concluded that the regular use of the secretion obtained from an extract of the thyroid gland would remove the symptoms of myxoedema. In 1891 he wrote: 'In order to test this, a glycerine extract of the sheep's thyroid gland was prepared and injected at intervals beneath the skin so as to ensure its absorption by the lymphatics in the same manner as the normal secretion is conveyed into the circulation from the healthy gland. The symptoms of myxoedema in the first case I treated in this manner rapidly disappeared, thus proving that the thyroid gland is a true internal secretory gland and that the thyroid extract is a specific remedy for myxoedema.'

It was not very long before the injected glycerine extract was replaced by the taking of thyroid extract by mouth. In that day the hypodermic syringe was not considered the method of choice for the use of medical preparations.

It is now 25 years since I was Prof. Murray's House Physician, but I am still conscious of the dignity which surrounded his coming. It was an invariable custom, on his departure from the hospital, for me to accompany him to the main entrance, where he would shake hands and wish me good day. At that time the dignity of the profession was maintained by such means, and although changing times have produced changing customs, the necessity for maintaining the dignity of the profession has not diminished.

Those of us who have been in medicine during the past 25 years have been able to watch the progress which has been gaining in speed and momentum. The enormous developments in X-ray diagnosis and treatment, the work of Banting and Best on diabetes, liver therapy, the introduction of the antibiotics—each one of these has brought about a revolution. The introduction of the ethical preparations and the new methods of prescribing have greatly altered medical practice. Indeed, to-day the medical student may do much more for the patient in a larger field than the professor could do 25 years ago. Maybe we can say that the battle to conquer disease is half won.

Side by side with this scientific medicine which has been developing with such increased momentum during the past 100 years, there has been the development of medicine in relation to social life—the approach through the community. This began with public health and sanitation and the prevention of social diseases, but it also has made very great progress in the last generation. If scientific medicine has tended to think in terms of disease and its cause, so social medicine has tended more and more to develop the positive idea of health and its promotion.

As Prof. J. A. Ryle has said: 'Social medicine must be developed from and have its foundations in a sound social pathology.' Here the medical man has entered into a joint field with other groups of social workers.

The philosophical basis of any science is slow to change. Perhaps we may say that medicine has concentrated its energies upon scientific development and has neglected its philosophical development. We are the trustees of the medical heritage—but that heritage belongs to the common man, and we must see that he is able to come into it.

Further we have got to see that medicine makes its contribution to the common health and happiness and with its enormous gains in potential, it does not ultimately fail in practice. We certainly must be able to refute the allegation that medicine is simply perpetuating the survival of the unfit.

Somerset Maugham in *A Writer's Notebook* says: 'It is not in a cathedral, or confronted with any mighty human work, that I feel the insignificance of man. . . . Nature and art, even against one's will, persuade one of the grandeur of man; and it is only science that reveals his utter insignificance.'

Progress in scientific medicine is not enough. It seems that whereas other men of science have been able to pursue their intellectual tasks without reference to human need or ethical considerations, other than those immediately connected with the pursuit of truth and respect for their colleagues, the medical man has a far heavier and more complex burden; for he has a special duty in respect of the community, his patients, his colleagues and his science or calling.

In our relationship with the community we enter the field of the sociologist, the statesman, the teacher and other social workers. We have here got to recognize our task in relation to the general life of society.

There is a recognition by Government the world over that a healthy nation is the greatest national asset and that health and happiness are the ideals for the individual. Reforms are necessary and overdue. Social services are developing at a variable rate.

Hospitalization. No longer are free or honorary services to be accepted from the medical profession. This may very well be a good thing. The community will now pay for the doctor's services in hospital and will in consequence exercise more control. The honorary system, however, was undoubtedly linked with the idea of medicine as a vocation or calling and its passing will prelude changing relationships. By standing firm on certain principles we have prevented the Province from introducing into its hospitalization scheme certain features which we considered unjust and unacceptable; but we must remember that we have a vital interest in the success of this hospitalization scheme, for the public are entitled to a first-class service.

It may be in the field of economics that things will break down. The daily average cost of hospitalizing a patient in a voluntary hospital in England in 1938 was 11s. 6d. By 1945 it was 24s. and by 1948 it was 34s. Figures in the U.S.A. and Sweden show an even greater increase. In Johannesburg the daily rate rose to 34s. per day in 1948. The Pretoria General Hospital is spending almost £15,000 annually on penicillin alone. Maybe modern scientific medicine is going to become too expensive for any government.

When we come to our responsibility to the individual patient, our scientific background is not enough. There are those from within the profession who are willing to foster the idea with the public that medicine is a science and that there are very many branches of the science and that specialist knowledge and training are necessary to solve the scientific problem. They indicate that the best results are obtained by subjecting the patient to the attention of a series of specialists and these

quantitive reports are subject to the survey of a supreme director. The financial aspect of this need not be dilated upon.

There is also the other point of view that medicine is also an art and that judgment is as important in the practice of medicine as it is to the lawyer, the judge or the artist. I feel that although medicine owes so much to the scientific approach, its practice is an art and it is by the true and effective practice of that art that medicine will ultimately succeed or fail.

We must remember that the members of our profession are accepted and trusted as guides and advisers in much more than matters of health. They touch men's lives at many sensitive points. It is by virtue of this that the medical man may make a great contribution towards the medical goal quite outside the scientific conception. A doctor must have a clear and surely based doctrine of life behind him.

It is here that the doctor's creed and ethical code becomes indispensable. It is interesting to note that the World Medical Association has at the outset of its life issued a report on Medical Ethics and produced the Declaration of Geneva which has been specifically accepted in South Africa. Further, Federal Council at its last meeting decided to draw up a booklet of Ethical Rules for the guidance of members. I believe that an appreciation of the Ethical Code should help inspire all members to a feeling of belonging to a great profession with a greater recognition of its responsibilities rather than its privileges.

Not least important in a comparatively lucrative profession such as medicine is the necessity to beware the snare of wealth. As an eminent scientist put it, and it applies to doctors: 'The success of a business man is measured by the amount of money he earns. The success of a scientist should be measured by the amount of money he refuses to earn.'

The doctor also has a special duty to his colleagues and his calling. The relation of a general practitioner to his general practitioner colleague has a background and tradition which is fairly well observed. The relationship of the specialist to the general practitioner is a newer problem and has not yet achieved a traditional solution. Historically our Ethical Code and the establishment of Specialist Groups both took form in 1929 and were referred to editorially in the *Journal* of the Association in March, 1929, by the late Dr. Leipoldt. I quote from his second editorial on Specialist Groups: 'There is no intention to welcome small coteries that are formed on exclusive lines... for although our professional tolerance is very deep and broad, we are sane enough to realize that over-stretched exclusiveness savours of an intellectual arrogance which we do not need.'

When my old Chief, Prof. Murray, finally retired from the Chair of Medicine, his Ex-house Physicians gave him a dinner and a parting gift. Of the 16 or more of us who were present, two were general practitioners and the Professor in his speech mentioned this and described the general practitioner as 'the backbone of the profession'.

In the larger towns I think that backbone is already beginning to feel the strain. Whilst one recognizes that specialization and scientific advance are linked together and that specialization is a real and vital contribution in the effort to bring health to the community, the general practitioner, who represents 80% of the profession, must be a contented colleague.

The cost structure of medical attention in illness has been based on the fees of the general practitioner. In appointing medical men on a salaried basis to posts in the Transvaal Hospitals, the specialist and the general practitioner have been appointed more or less on the same scale of salary. In private practice, I suggest that the large variation in fees has been accepted on the assumption that the specialist is acting primarily as a consultant.

I do consider that one of the pressing needs of the profession is to find some method of combining general medical practice and specialist practice into effective team work, so that each is able to pull its weight and so fully contribute towards the medical ideal.

One of the main reasons why the newly qualified medical man wishes to avoid general practice is that it becomes too busy a life and so it lacks leisure. The absence of leisure is most serious. Culture is essentially a product of leisure. The Chinese say that the man who is wisely idle is the most cultured. With the problems that are facing us it is essential that we should have time to think. Change is in the air and it will not pass us by.

I have tried to-night to assist you to outspan your mind and allow it to wander over various medical pathways. It is our duty to preserve and extend the life, health and happiness of our patients and of the community and whatever development may take place within the profession we must ever remember this and so it is for us to point the way.

IN MEMORIAM

DR. NEIL M. MCFARLANE C.B.E., M.A., M.D.

The death of Dr. Macfarlane on 18 February 1950, has removed one of the few remaining personal links with the Basutoland Administration of the last century.

He joined the Basutoland Government Service in 1893—nine years after Basutoland was transferred from the Cape Colonial to the Imperial Government three months before the administration of the late Sir Marshal Clarke, *C.M.G.*, R.A., who was the first Resident Commissioner in the Territory (1884). This placed Dr. Macfarlane among the veterans of the Service.

Nearly all revenue in those early days was required for administrative and judicial purposes and very little money was available for developing medical and other social services. Nevertheless Drs. Long and Macfarlane, both men of unusual constructive, administrative and professional ability, in the face of stringent economy, collaborated to lay the foundations of, and developed a Medical Service which has been of untold benefit to Basutoland and a credit to the Government.

Dr. Macfarlane, a descendant of rugged Highland stock was born on 2 January 1866, at Stanley, Perthshire, Scotland. On leaving school he proceeded to Aberdeen University where he graduated M.A., M.B. and C.M. in 1889, taking the M.D. degree with honours in 1897. His intention was to specialize in diseases of children, but for health reasons he was obliged to leave Britain and come to South Africa where he joined the Basutoland Administration. After short spells of duty at Mafeteng, Mohale's Hoek and Quthing he was posted to Leribe in 1896. There, for the best part of 25 years, single-handed he supplied the medical needs of a district comprising a population of over 80,000; this in addition to many other duties of a district medical officer. For the first 11 years primitive huts served for hospital accommodation and elementary nursing was given by untrained native attendants. It was not till 1907 that he was provided with a modern hospital staffed by two European Nursing Sisters. In 1920 he was appointed Medical Superintendent of the Botsabelo Leper Settlement and three years later he succeeded Dr. Long as Principal Medical Officer. Before his retirement in 1928 his valuable services to the State were recognised by the award of the C.B.E.

Though he left Basutoland on pension over 20 years ago, his professional and administrative influence is still felt in the Medical Department. He is remembered by many of his former European and African patients and by his many friends for his professional skill, and his cheerful and sympathetic nature. To him a patient—black or white—was a human being and not just a 'case'. Besides treating their ailments he was their guide, philosopher and friend. He religiously upheld the ethical traditions of his profession and deplored any tendency to prostitute it for financial gain. He was a man of culture, a clear thinker and a gifted writer. He contributed to medical journals matters of professional interest. Among his writings is a brochure entitled *A Record of Medical Work and the Medical Service in Basutoland*, which, in addition to being a complete compilation of all doctors in the territory from 1844 to 1933, includes some interesting and little-known facts connected with the Morosi rebellion (1879) and the Basutoland Gun War (1880-1881). *Inter alia* he mentions that four Victoria Crosses were awarded in these campaigns, the recipients being Surgeon E. B. Hartley (C.M.R. and later P.M.O. of the Cape Colonial Forces), Surgeon T. F. McCrea (Cape Mounted Yeomanry), Surgeon P. C. Scott (C.M.R.) and Pte. Peter Brown (C.M.R.).

Besides his active interest in the British and South African Medical Associations, Dr. Macfarlane took a keen interest in the social life of Basutoland including freemasonary, the Caledonian Society and the Basutoland Branch of the B.E.S.L., of which he was a foundation member and its first president. In the Anglo-Boer War he was a civil surgeon in charge of a British military hospital at Leribe which served the sick and wounded of the forces operating in the North Eastern Free State. During the 1st Great War he was released by the Government for war service and held a commission in the South African Medical Corps with the rank of major. Again in the 2nd Great War at the age of 74 he offered his services to Basutoland to release a doctor of military age. For four years from 1940 he was in sole charge of the Scott Hospital, Morija, frequently attending up to 100 out-patients in a day besides his hospital work. His services here were cut short by an untimely injury, sustained on duty, which deprived him of the use of his right hand. Nevertheless, with amazing determination at the age of 79 he taught himself to write with his left hand—his one complaint was that his thoughts did not flow so freely down his left arm as down his right!

After his retirement in 1928 he settled in Durban, Natal, where he took an active and prominent part in the Durban Juvenile Affairs Board and the committee of the Durban Community Chest.

In 1895 he married Miss Agnes I. Winchester of Loanhead, Rathven, Banffshire, Scotland, who survives him. Their only son Donald served in the 1st Great War with the Gordon Highlanders with the rank of major and again in the 2nd Great War with the Pioneer Corps. Wherever they were stationed, Dr. and Mrs. Macfarlane's home was one of culture and cordial friendship. We tender our deep sympathy to Mrs. Macfarlane and her family and pay homage to the memory of a great soul.

H. W. Dyke, C.B.E.

PASSING EVENTS

Dr. Allan B. Swarbreck, after three years' post-graduate study and appointments in Great Britain, has returned to Johannesburg where he will practice as an obstetrician at 503, Cavendish Chambers, 183, Jeppe Street, Johannesburg.

Dr. Swarbreck is especially interested in the investigation and treatment of sub-fertility in women.

Telephones: Consulting Rooms: 22-4584; Residence: 45-5083.

OPHTHALMOLOGISTS AND OTOLARYNGOLOGISTS

Dr. W. L. Benedict, Editor of the *Transactions of the American Academy of Ophthalmology and Otolaryngology*, 100 First Avenue Building, Rochester, Minnesota, U.S.A., has advised the Ophthalmological Society of South Africa that at the annual Council Meeting of the Academy in October, he was authorized to initiate two new departments in the *Transactions*. One of these features is the bimonthly listing of ophthalmologic and otolaryngologic societies, giving the names of the president and secretary, the address of the secretary, the place of meeting, and the regular date of meeting. This listing will supersede the listing which has formerly appeared once annually in the *Archives of Ophthalmology*. In order that the listing may be up to date in every respect, and thus of greatest value to readers you are invited to send the current information regarding your society as soon as possible and, in the future, keep the Editor of the *Transactions* informed of any changes which may occur.

Publication of a listing of positions available in the fields of ophthalmology and otolaryngology has also been begun. Upon receipt of information, the *Transactions* will list institutions, clinics, hospitals, private groups, private practitioners, industries, governmental agencies, etc., which are interested in securing physicians trained in these specialties. The information sent should include:

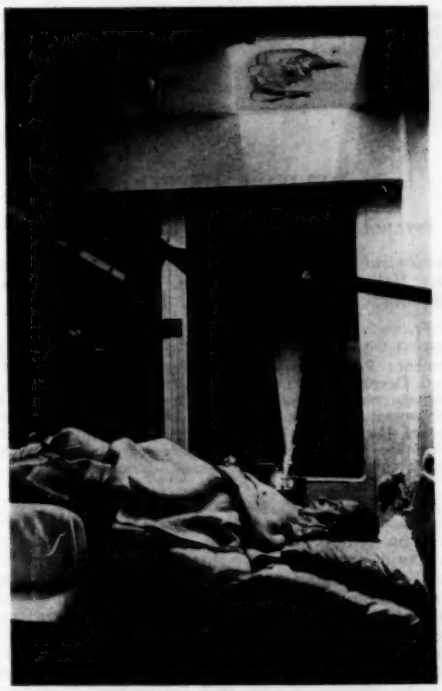
1. Type of physician wanted (ophthalmologist or otolaryngologist, diplomate, resident, etc.);
2. Type of position to be filled;
3. Whom to write for further information.

Listings will be published once only unless otherwise requested. Ophthalmologists and otolaryngologists who are seeking positions will be assisted in a similar way.

The *Transactions* is always happy to publish news of interest concerning the societies. Notice of coming events should be sent as far in advance as possible in order that publication may be timely.

PROJECTED BOOKS

Western Province Charity Bioscopes have available a ceiling projector for use by partially or completely paralysed persons in the Cape Peninsula who, due to their disability, are physically incapable of reading books in a normal manner. The function of a ceiling projector is to project books in microfilm form on to the ceilings of wards and sick-rooms. It is operated by means of a switch which, placed in contact with any portion of the patient capable of exercising light pressure, 'turns the pages' as and when desired.



Margaret Carter (10) has to lie on her back for months while undergoing orthopaedic treatment. A ceiling projector helps to brighten and pass the weary hours. She is here seen looking at her favourite picture book.

(With acknowledgments and thanks to photographer Raymond Kleboe and "Picture Post")

An initial library of 30 books by well-known authors has been acquired. Western Province Charity Bioscopes, who also provide nearly 50 cinema entertainments each month at hospitals and homes in the Cape Peninsula, will be pleased to learn of any patients who might benefit by having the use of the projector. There is no charge whatsoever for the loan of the machine and enquiries should be addressed to P.O. Box 1643, Cape Town.

QUESTIONS ANSWERED

Treatment of Combined Tuberculosis and Syphilis

Q. In a case of pulmonary tuberculosis with syphilis, what is the treatment of choice for the syphilitic condition?

It has been my impression that arsenicals aggravate the pulmonary lesion, but this is an impression based on the treatment of only two or three cases.

A. In cases of combined infection of tuberculosis and syphilis, the treatment for the former must be given priority.

Moore, in his *Modern Treatment of Syphilis*, written in the pre-penicillin era, states that 'energetic treatment for syphilis may not only precipitate general dissemination of the infection in an individual with an acute tuberculosis, but may also cause activation of an apparently quiescent focus'.

Iodides should be avoided at all times. Arsenic should not be given, or given only in small doses.

The treatment of choice is two to three weeks of an intramuscular preparation of bismuth, preferably the salicylate. This can be followed by penicillin, preferably crystalline procaine penicillin G in oil with 2% aluminium monostearate, intramuscularly, in a dose of 600,000 units every other day, for 10 injections.

Further treatment depends on the stage of the syphilis.

REVIEWS OF BOOKS

Psychological Aspects of Clinical Medicine

Psychological Aspects of Clinical Medicine. By Stephen Barton Hall, M.D., D.P.M. (Pp. 416 + xii. With six illustrations. 21s.) London: H. K. Lewis & Co., Ltd. 1949.

Contents: 1. Introduction. 2. Investigation. 3. Intellectual Development: Psychometry and its Application to Medicine. 4. Emotional Development and Psychopathology. 5. Common Forms of Psychoneurosis. 6. Psychological Symptoms and Physical Disease. 7. Psychosomatic Relationships. 8. Abnormal Behaviour as a Symptom of Disease. 9. Relations of Psychoneurosis to Psychosis. 10. Personality Disorders. 11. Psychological Aspects of Management and Treatment. Index of Names. Index of Subjects.

To the vast literature devoted to the psychological and psychosomatic aspects of human behaviour, Dr. Barton Hall's new book will be a welcome addition. It is certainly not an easy task to avoid mere repetition in a field which has been so extensively surveyed in recent years. The author's approach to the subject is in line with the recommendations made by the B.M.A. Committee on Mental Health in their report of 1941, wherein the following was advised in regard to undergraduate training in medical psychology: 'The general object should be, not to produce specialists in psychological medicine, but to make students realise that this subject is not in some mysterious way different from the rest of medicine and that an individual is a complete human being with both mental and physical functions who, if he falls sick, is still a person rather than a vehicle of abnormal laboratory findings.'

In *Psychological Aspects of Clinical Medicine* the psychosomatic school of medicine is expounded in the clearest and most practical manner. Clinical medicine and psychology are integrated into a coherent whole, the greatest emphasis being placed on the methods to be adopted in approaching the patient's life situation from the sociological, psychological and clinical angles. Particularly valuable are the chapters devoted to case-taking and integration of data obtained with personality studies of the patient as a psychosomatic whole. Equally lucid and authoritative are the chapters on management and treatment.

Here is one of the best introductions to this field which we have had in recent years. It should be most useful to both the student and to the general practitioner. The work is profusely illustrated with case histories taken from both hospital and clinic practice, whilst appended to each chapter there is a very comprehensive bibliography of references and recommended reading.

This is a book which can be enthusiastically and unhesitatingly recommended to all practitioners of medicine and particularly to students of social medicine.

Public Health Law

Introduction to Public Health Law. By John J. Clarke, M.A., F.S.S. (Pp. 138. 12s. 6d.) Cleaver-Hume Press Ltd. London: 1949.

Contents: 1. Introduction. 2. The Administrative Framework. 3. The Legal System and Local Authorities. 4. The Public Health Act, 1936, and its Local Administration. 5. Sewerage and Sewage Disposal. 6. Private Sewers, Drains and Sanitary Conveniences. 7. Provisions and By-Laws with respect to Buildings. 8. Removal of Refuse and Cleansing. 9. Nuisances and Offensive Trades. 10. Provisions concerning Water Supply. 11. The Water Act, 1945. 12. Prevention, Notification and Treatment of Disease. 13. Baths, Washhouses, Common Lodging Houses, Canal Boats, etc. 14. The Food and Drugs Act, 1938. 15. Cognate Powers and Functions. 16. Notification of Births, Maternity, Child Welfare. 17. The National Health Service Act, 1946. Appendix: A Century of Public Health Legislation; Short Bibliography; Index to Statutes, Regulations, Orders, etc.; Index to Cases; General Index.

Although this little book refers to Public Health Law as it pertains to England, those concerned with public health in this country will find much of interest in it. The first part of the book contains an introduction to the subject which should be useful to public health students, explaining in simple language the mechanism of civil law procedure. Though the actual statutes quoted in the body of the book are for the most part only of academic interest to the South African health officer, they show how closely, until recently, we have followed the overseas example. The chapter on the National Health Service Act of 1946 is as concise a summary of this important piece of legislation as the reviewer has yet seen. Throughout the book the author refers to the historical background of the English public health system, and this not only helps to sort out the maze of apparently unrelated functions into their correct perspective, but also makes the book surprisingly readable.

Cluver's Medical and Health Legislation

Medical and Health Legislation in the Union of South Africa. By E. H. Cluver, K.St.J., E.D., M.A., M.D., B.Ch. (Oxon.), D.P.H. (Eng.), F.R.S.I. (Pp. 763+xi. £2 17s. 6d.) Johannesburg: Central News Agency Ltd. 1949.

Contents: 1. Medical, Dental and Pharmacy Act. 2. The Nursing Act. 3. The Food, Drugs and Disinfectants Act. 4. Public Health Acts. 5. Housing Acts. 6. The Slums Act.

Dr. Cluver is to be congratulated upon yet another and extremely valuable contribution to public health literature. For many years those engaged in public health administration and in the teaching of public health have experienced considerable difficulty in obtaining copies of the relevant Acts and Regulations. By assembling the many varied Acts, Rules and Regulations dealing with medical and health practice in the Union, Dr. Cluver has met a long-felt want. This volume must be on the desk of all those engaged in public health administration. It will also be invaluable to students taking the post-graduate course of the Diploma of Public Health, and to those taking the Royal Sanitary Institute courses for health inspectors and health visitors.

The author has written excellent commentaries on each of the principal Acts and the Regulations made thereunder. The section in Part I dealing with the South African Medical and Dental Council is very comprehensive and particularly well arranged, and should provide all the information required by the various professional and auxiliary groups.

Reference to the subject matter is greatly facilitated by the provision of an excellently arranged index.